

## NETWORK ACCESS TO PCDS (SPAN, ESN, SESNET, ARPANET)

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One of the major goals of the National Space Science Data Center is to increase access to NASA data systems by enhancing networking activities. The activities are centered around three basic networking systems: the Space Physics Analysis Network (SPAN); the Earth Science Network (ESN); and the NASA Packet Switched System (NPSS). In this presentation, each system was described, linkages among systems were explained, and future plans were announced. The inclusion of several new climate nodes on SPAN or ESN was also mentioned. Presently, the Pilot Climate Data System is accessible through SPAN and will be accessible through NPSS by summer and ESN by the end of 1986.

Ambitious plans for implementation are underway. The implementation of these plans will represent a major advance in the utilization and accessibility of data worldwide. The interdisciplinary opportunities afforded for correlative studies will further expand the nature and scope of future research using NASA data.

Copies of the SPAN technical memorandum, TM-86499, and of the "First Earth Science Pilot Coordination Meeting" minutes are available on request from NSSDC.

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### NSSDC NETWORK INVOLVEMENT

- o SPACE PHYSICS ANALYSIS NETWORK (SPAN)
  - OPERATIONAL (120 COMPUTER NODES)
  - MAJOR REDESIGN UNDERWAY
  - COMBINES SPACE PHYSICS, ATMOSPHERIC, PLANETARY, AND OCEANS (FUTURE) NODES
  - GSFC, PENN STATE, U OF MICHIGAN, MIT & NCAR
- o EARTH SCIENCE NETWORK (ESN)
  - MAJOR DEVELOPMENT UNDERWAY
  - EXPECT PARTIAL OPERATIONS BY SEPTEMBER
  - FULL OPERATION BY DECEMBER 86
- o NASA PACKET SWITCHED SYSTEM (NPSS)
  - EXCELLENT TELENET CONNECTION
  - HAS SPAN GATEWAY AT MSFC
  - EXPECT NSSDC GATEWAY BY JULY
  - PRIMARY TERMINAL TRAFFIC
  - NPSS PART OF NASA'S PROGRAM SUPPORT COMMUNICATION (PSC) HIGHWAY
- o NEED TO IDENTIFY MAJOR CLIMATE NETWORK NODES FOR SPAN OR ESN

WHAT IS THE SPACE PHYSICS ANALYSIS NETWORK (SPAN)

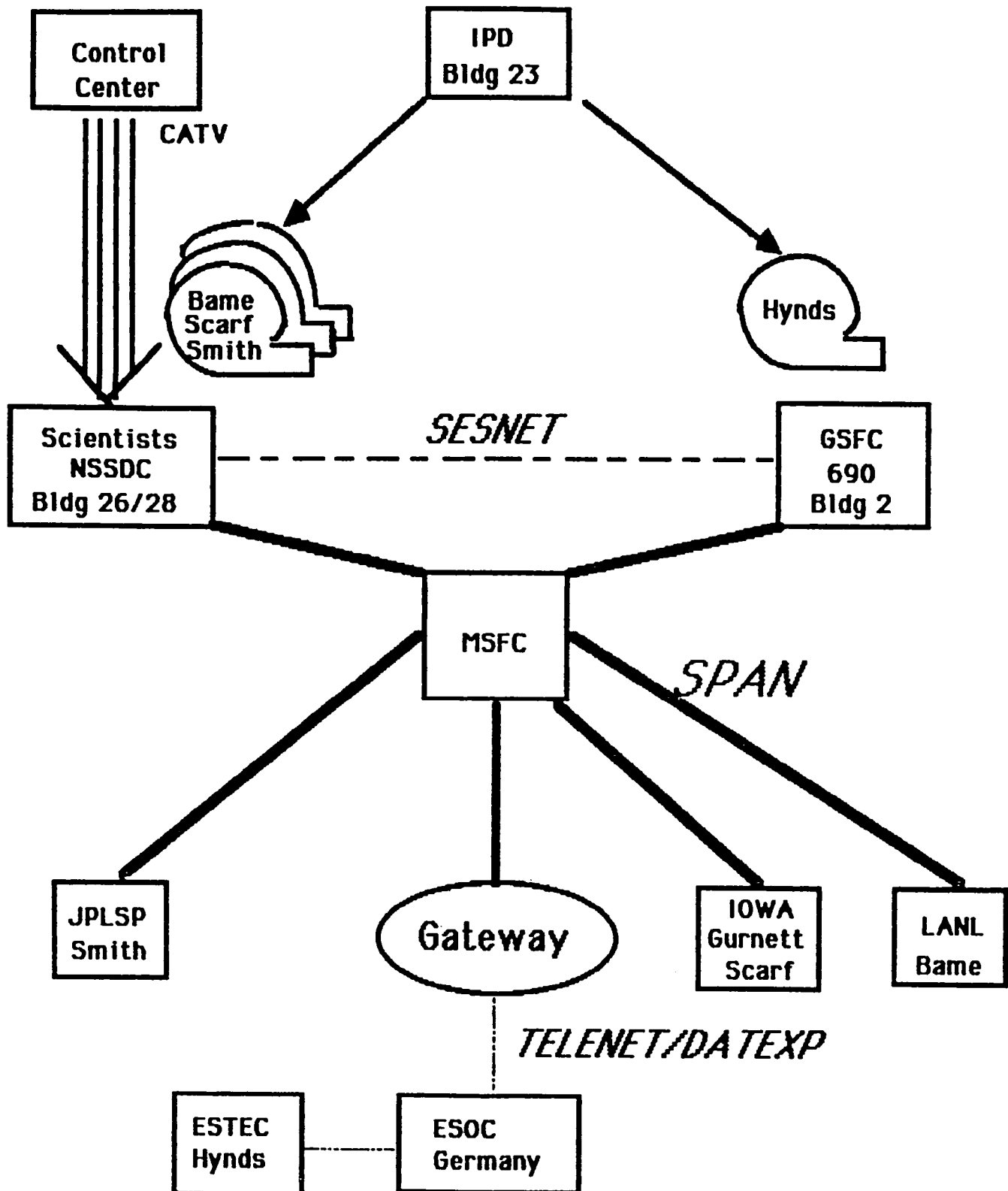
- o SPAN DESIGN STARTED IN 1980; SPAN OPERATION STARTED IN 1981
- o SPAN IS A MULTI-MISSION, CORRELATIVE DATA COMPARISON NETWORK
- o SPAN IS "RUN" BY THE USERS (DATA SYSTEMS USERS WORKING GROUP)
- o SPAN IS A COMPUTER-TO-COMPUTER COMMUNICATION SYSTEM (DECNET)
- o SPAN UTILIZES MUCH OF THE ALREADY PAID FOR NASA EQUIPMENT
- o NSSDC HAS BEEN A SPAN NODE SINCE OCTOBER 1984



# European Nodes Connected to SPAN



# ICE Communication Support



NSSDC

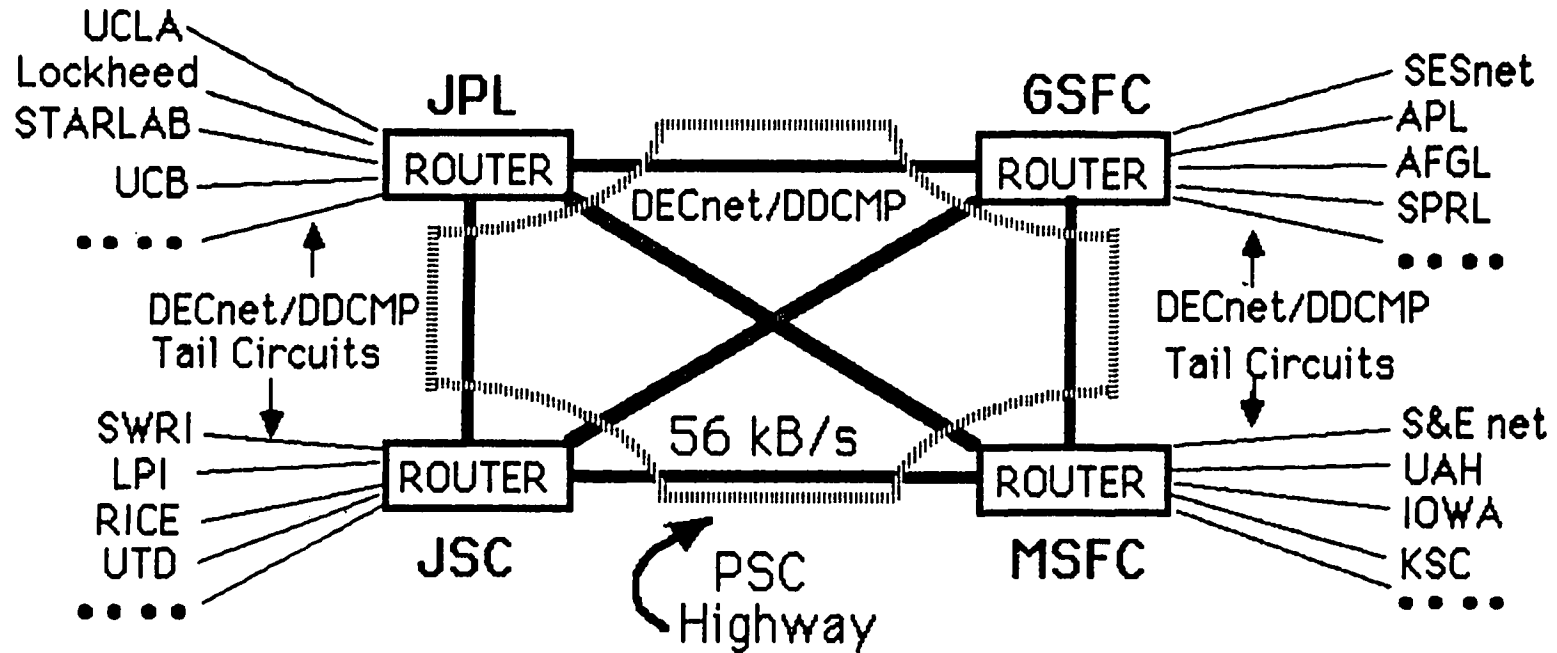
SEPT 12/85

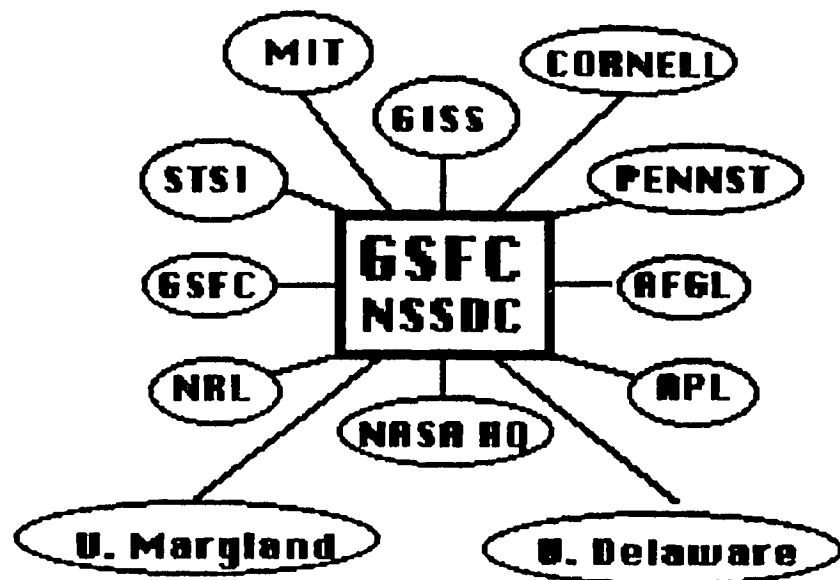
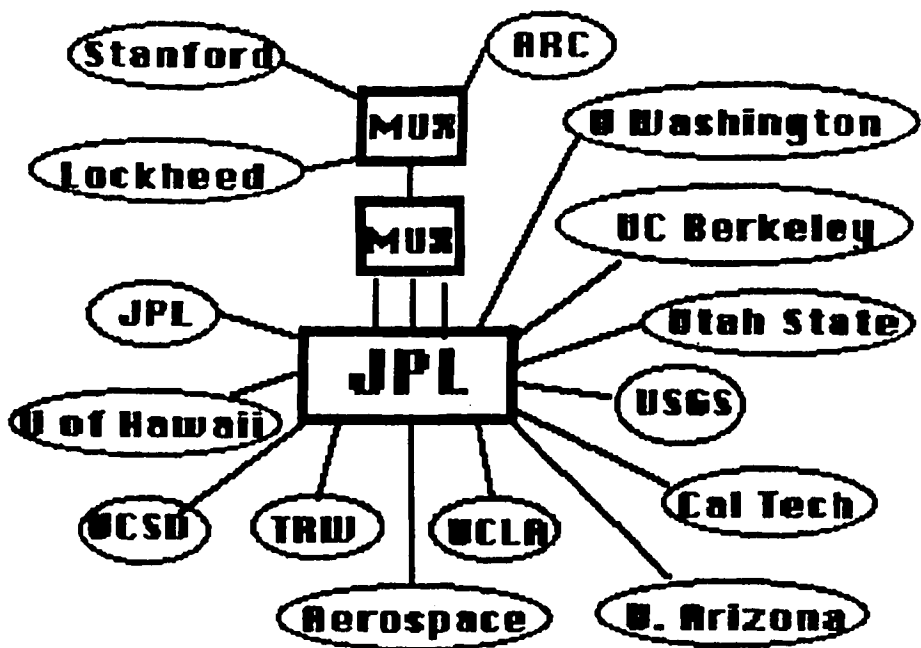
#### FUTURE GOALS OF NSSDC/SPAN

- "OPEN UP" NSSDC RESOURCES TO ELECTRONIC ACCESS
  - PCDS, PLDS
- DATA CATALOGS AND DIRECTORIES ONLINE
  - "ROAD MAP" FOR SPACE AND EARTH SCIENCE DATA
- SERVICE REQUEST
  - NSSDC::REQUEST
  - NETWORK DESIRED DATA (SMALL AMOUNTS, DOCUMENTATION, PLOT FILES, ETC.)
- NSSDC FACILITIES TO COME ON SPAN
  - ASTRONOMICAL DATA CENTER
  - CDAWS AND SSC
- PSC WILL PROVIDE THE LINES (MARCH/APRIL 86)
  - REDESIGN SPAN WITH HIGHER (DYNAMIC) BANDWIDTHS
- MAJOR LINES TO EUROPE AND JAPAN
- DEVELOP GATEWAYS TO OTHER NETWORKS (NPSS, ESN, SESNET, ETC.)

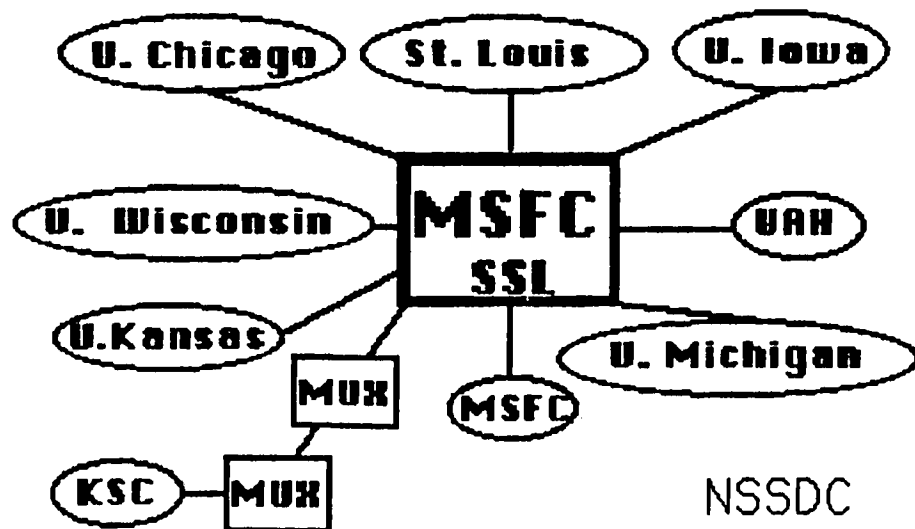
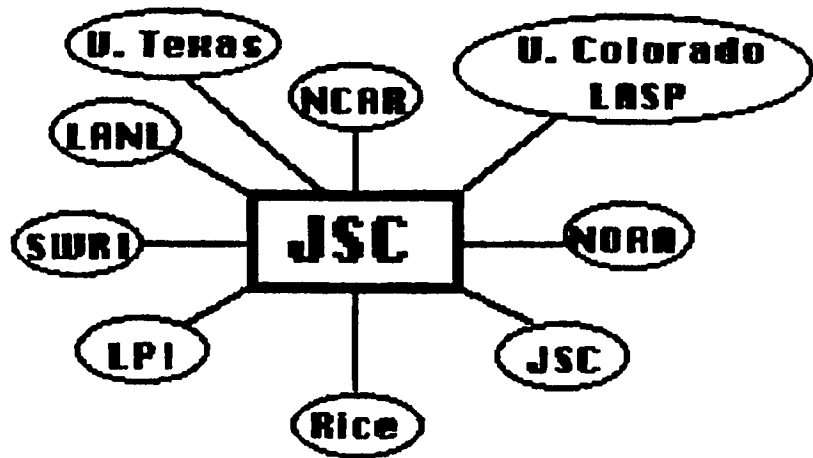


# SPAN Use Of PSC





## *SPAN CONFIGURATION*



NSSDC

Nov 15/85-3

## RECENT REFERENCES ABOUT SPAN

D.N. BAKER, R.D. ZWICKL, AND J.L. GREEN, THE NASA DATA SYSTEMS USERS WORKING GROUP: RECOMMENDATIONS FOR IMPROVED SCIENTIFIC INTERACTIONS EOS (MEETING REPORT) 65, 46, 1984.

SPAN PILOT PROJECT REPORT, EOS (MEETING REPORT), 65, 111, 1984.

J.L. GREEN, SPACELAB DATA ANALYSIS USING THE SPAN SYSTEM, IN THE NATIONAL SYMPOSIUM AND WORKSHOP ON OPTICAL PLATFORMS, PROC., SPIE 493 (C. WYMAN EDITOR), 370, 1984.

J.L. GREEN, D.N. BAKER, AND R.D. ZWICKL, DSUWG MEETING REPORT, EOS, (MEETING REPORT), 66, 565, 1985.

J.L. GREEN AND D. PETERS (EDITORS), INTRODUCTION TO THE SPACE PHYSICS ANALYSIS NETWORK (SPAN), NASA TM-86499, APRIL 1985.

D.L. GALLAGHER, J.L. GREEN, AND R. NEWMAN, SPAN GRAPHICS DISPLAY UTILITIES HANDBOOK, NASA TM-86500, MAY 1985.

J.L. GREEN, AND R.D. ZWICKL, DATA SYSTEMS USERS WORKING GROUP ACCEPTED IN EOS, NOVEMBER 1985.

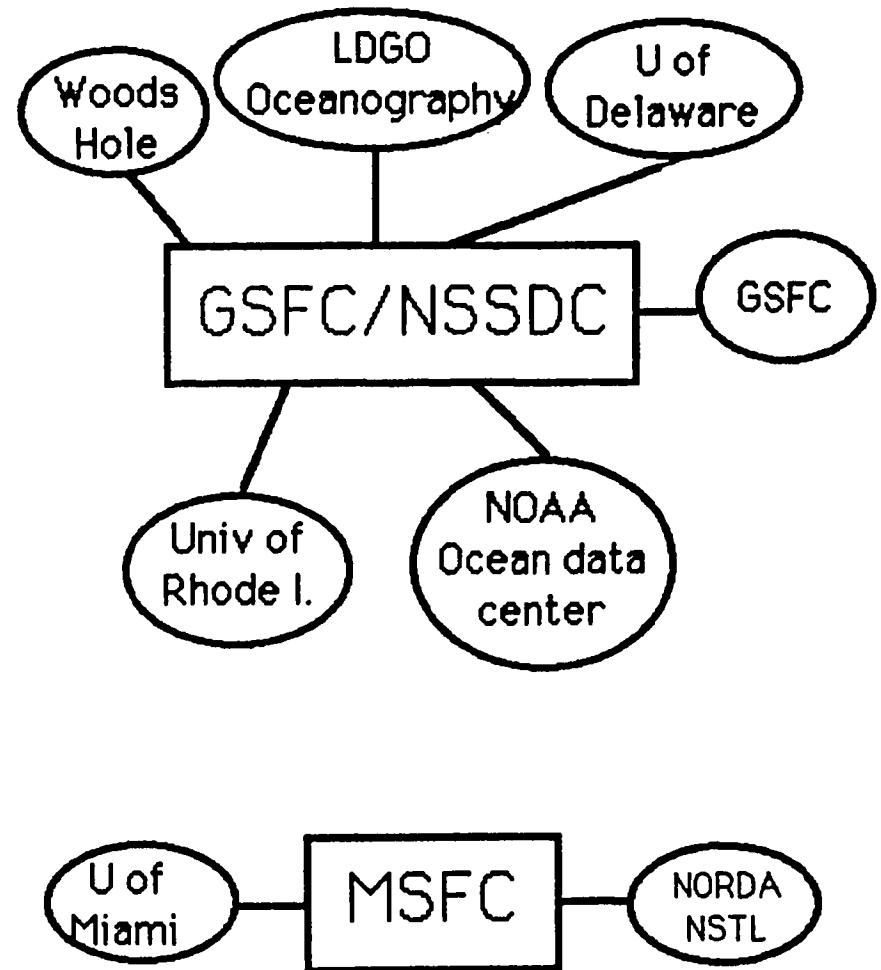
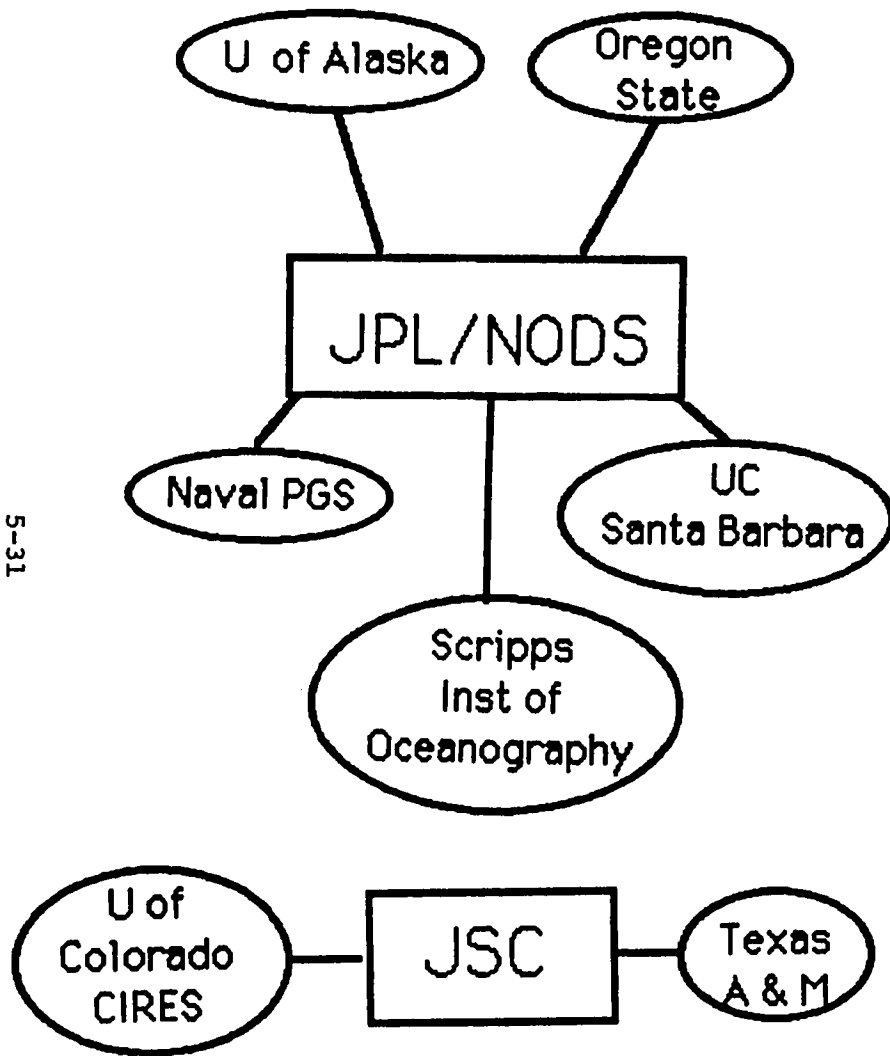
T. SANDERSON, S. HO, N. HEIJDEN, E. JABS, AND J.L. GREEN, NEAR-REALTIME TRANSATLANTIC TRANSMISSION OF ICE SPACECRAFT DATA USING THE SPAN NETWORK: THE COMET GIACOBINI-ZINNER ENCOUNTER, ACCEPTED IN THE ESA BULLETIN, DECEMBER 1985.

J.L. GREEN, AND J.H. KING, BEHIND THE SCENES DURING A COMET ENCOUNTER, ACCEPTED IN EOS, DECEMBER 1985.

EARTH SCIENCE NETWORK (ESN)

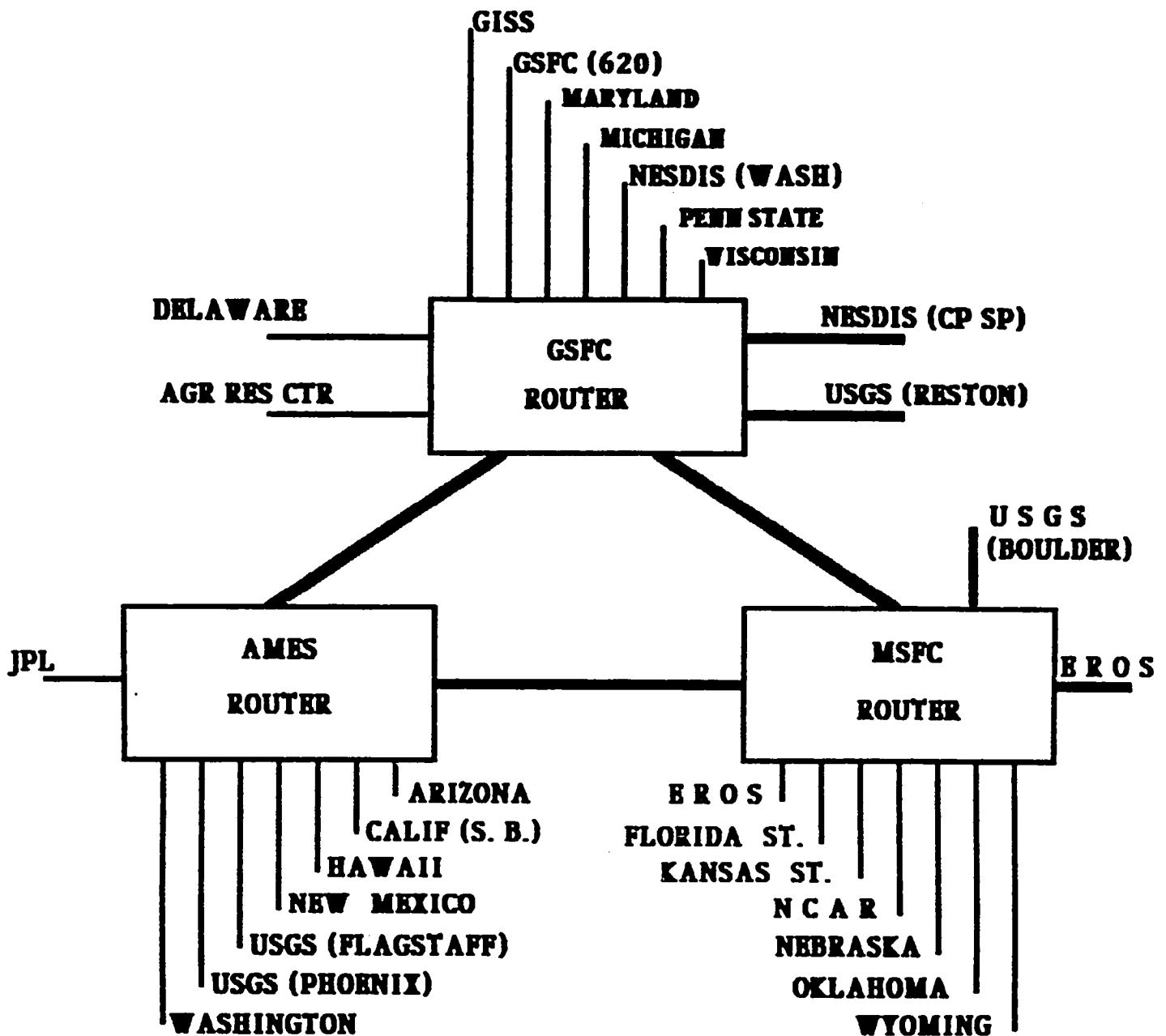
- BASED ON PILOT LAND AND OCEANS COMMUNICATIONS REQUIREMENTS
- PSC WILL PROVIDE THE LINES (AUGUST/SEPTEMBER 86)
- PROTOCOL CHOSEN TCP/IP AND DECNET
- CURRENT DESIGN SIMILAR TO SPAN
  - USE 56 KB/S BACKBONE
  - TAIL CIRCUITS CONNECTED TO ROUTING CENTERS AT 9.6 KB/S
  - PROPOSED ROUTING CENTERS GSFC, MSFC, JPL, AND AMES
- SOFTWARE/HARDWARE TO BE DETERMINED AND PROCURED
  - ROUTERS
  - INTERFACE

# SPAN/OCEAN NETWORK



NSSDC  
DEC 19/85

# EARTH SCIENCE NETWORK



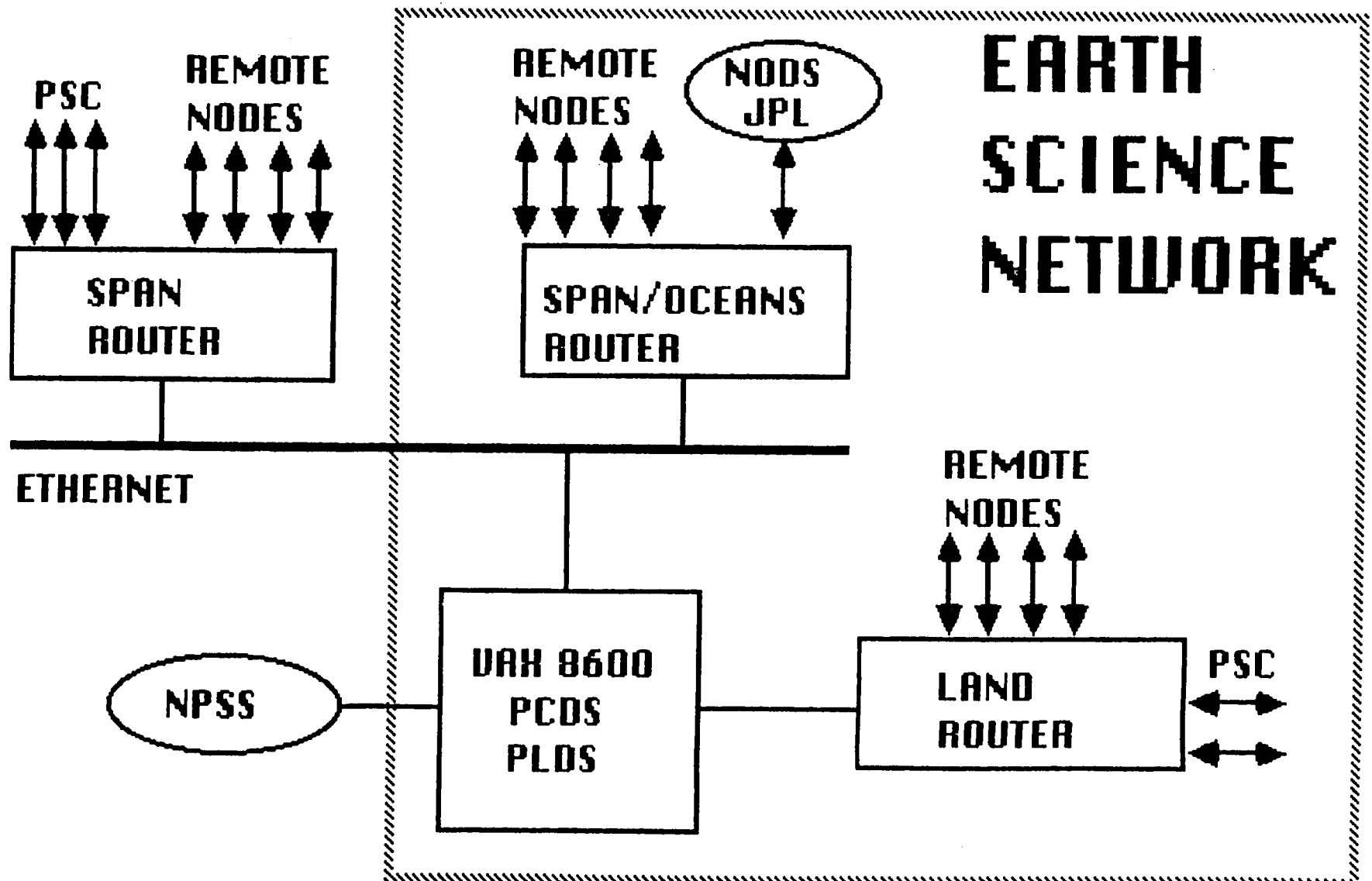
## PSCN DATA LINKS

— 56 K bits/sec. (SOURCE DATA)  
 — 9.6 k bits/sec. (USER DATA)

NSSDC

NOVEMBER 1985

# NSSDC NETWORK ACTIVITIES



5-33

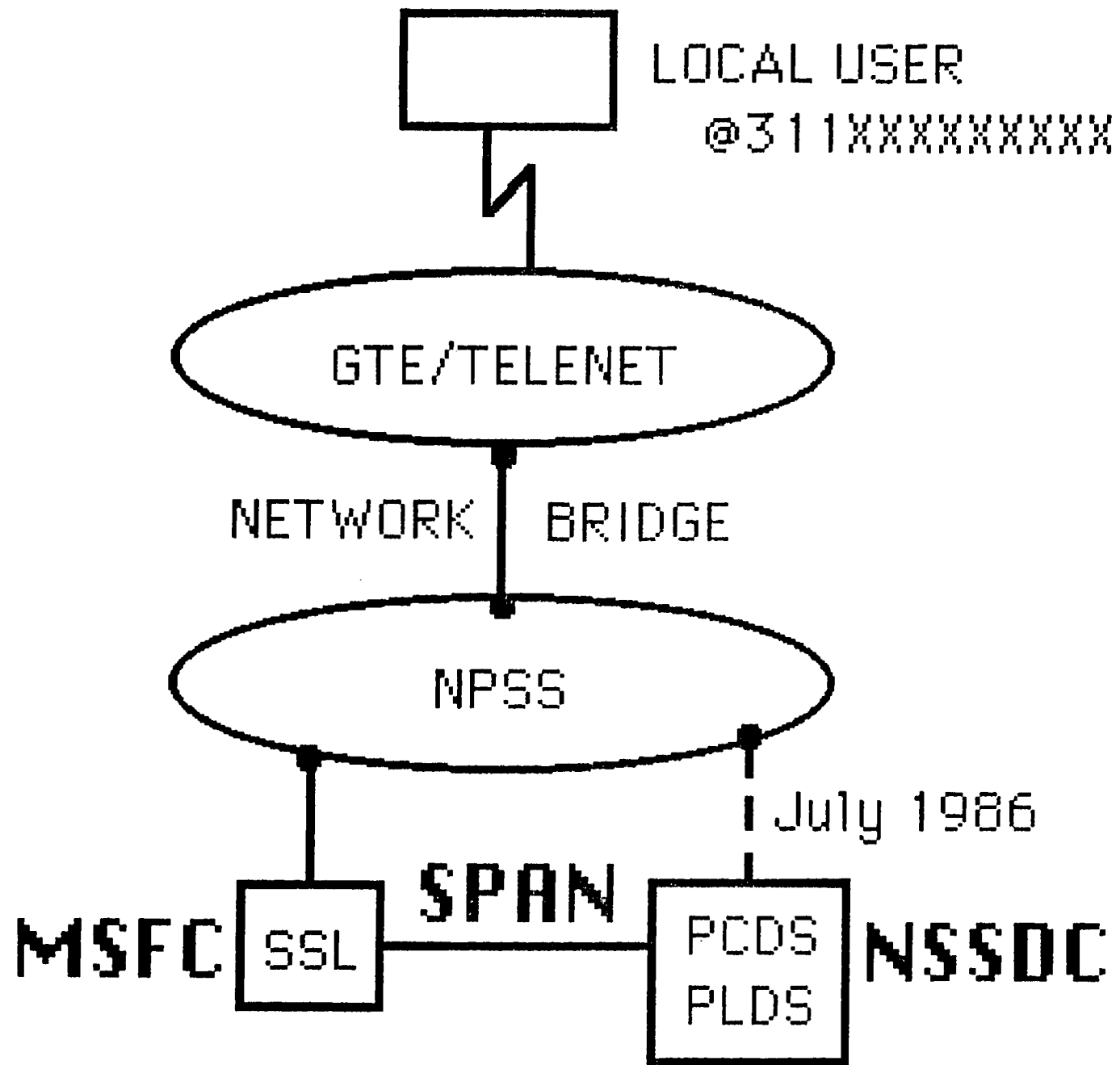
NSSDC

Dec 9/85

NPSS ACCESS TO NSSDC

- CURRENT NPSS CONNECTION AT MSFC
  - GTE/TELENET TRANSPARENT
  - MUST LOGON TO SSL
  - USE SPAN TO GET TO NSSDC
- NSSDC/NPSS CONNECTION OPERATIONAL BY JULY 86
  - PROVIDE TERMINAL ACCESS
  - LIMITED FILE TRANSFER
- NASA PAYS TELENET BILL





#### FUTURE GOALS

- o ADD PCDS SPECIFIC NODES TO SPAN OR ESN
- o LOOK FOR WAYS TO MERGE SPAN AND ESN  
INTO A UNIFIED NASA SCIENCE NETWORK

# SPAN Node Contact Information List

---

## MSFC Routing Center Location

=====

SSL

----

Discipline: Solar Terr., Planetary

Dennis Gallagher  
Mail Code ES01  
Marshall Space Flight Center  
Huntsville, Alabama 35812  
205/453-0108

Machine : SSL  
Bldg. : 4481  
Rm. : 303

## MSFC PSCN Tail Circuits

=====

UAH

----

Discipline: Solar Terrestrial

J. R. Sisk  
Roy Torbert (Alt)  
Research Institute Bldg.  
The University of Alabama in Huntsville  
Huntsville, Alabama 35899  
205/895-6318  
205/895-6417 (Alt)

Machine : UAH  
Bldg. : Research Institute  
Rm. : D14

U OF KANSAS

-----

Discipline: Solar Terrestrial

Rick Desko  
University of Kansas  
Department of Physics and Astronomy  
Lawrence, Kansas 66045  
913/864-3610

Machine : KUPHSX  
Bldg. : Malott Hall  
Rm. : B096

IOWA

-----

Discipline: Solar Terr., Planetary, Astro-  
physics

Larry H. Schroeder  
Room 114 VAN  
Department of Physics and Astronomy  
University of Iowa  
Iowa City, IA 52242  
319/353-5693  
319/353-5148

Machine : VAX-11/780  
Bldg. : Van Allen Hall  
Rm. : 209

SPRLA

-----

Discipline: Atmospheric, Astrophysics

Salim Linggi  
Space Physics Research Lab.  
University of Michigan  
2455 Hayward, Ann Arbor  
Michigan 48109  
313-763-6229

Machine : SPRLA  
Bldg. : Space Physics Research Lab  
Rm. : 2136

UNIVERSITY OF MIAMI

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Robert A. Evans  
RSMAS/MPO  
4600 Rickenbacker Cswy  
Miami, FL 33149  
305/361-4018

Discipline: Oceans

Machine: VAX-11/780  
Bldg. : Marine Science Center  
Rm. : 222

NAVY NORDA

-----  
John Schmidt  
NORDA  
Code 321  
NSTL, Miss. 39529  
601/688-5266  
FTS (494-5266)

Discipline: Oceans

Machine: VAX 8600  
Bldg. : 1105  
Rm. : 604

WASHINGTON UNIVERSITY

-----  
Susan Slavney  
Washington University  
St. Louis, MO 63130  
314/889-5493

Discipline: Planetary

Machine : WURST  
Bldg. : Wilson Hall  
Rm. : 10

CHICAGO

-----  
Gordon Lentz  
Laboratory for Astrophysics and  
Space Research  
Enrico Fermi Institute  
The University of Chicago  
933 East 56th Street  
Chicago, Illinois 60637  
312/962-7836

Discipline: Astrophysics

Machine : PDP-11/44  
Bldg. : Lab for Astrophysics and Space  
Research  
Rm. : 52

UNIVERSITY OF WISCONSIN

-----  
Chris Anderson  
University of Wisconsin  
Madison, WI 53706  
608/262-0492

Discipline: Astrophysics

Machine : VAX-11/780  
Bldg. : Sterling Hall  
Rm. : 5507

MIPS1 (MSFC/HOSC)

-----  
Harrell Phillips  
Mail Code EL23  
Marshall Space Flight Center  
Huntsville, Alabama 35812  
205/453-2617  
205/453-2850

Discipline: Spacelab, Space Station

Machine : TMIS VAX  
Bldg. : 4663  
Rm. : A109

KSC

-----  
Mark Juhr  
MS/PRC 2204  
Kennedy Space Center, FL 32899  
305/823-3180

Discipline: Spacelab, Space Station

Machine :  
Bldg. : Hg. Building  
Rm. : 3468

-----  
GSFC Routing Center Location  
=====

NSSDC  
-----

Discipline: All

Lee Foster  
Code 633  
GSFC  
Greenbelt, MD 20771  
(301) 344-5574

Machine : NSSDC  
Bldg. : 26  
Rm. : 121

GSFC PSCN Tail Circuits  
=====

NASA/HQ  
-----

Discipline: All

Dave Lavery  
NASA Headquarters  
Washington, DC 20546  
202/453-1772

Machine : POLLUX  
Bldg. : FOB10B  
Rm. : A13

ESOC  
-----

Discipline: All

Robert Bosch  
ESOC  
6100 Darmstadt  
West Germany  
49-6151-886-659

Machine :  
Bldg. : Meteorsat Bldg.  
Rm. : 190 (2nd floor)

AFGL  
-----

Discipline: Solar Terr.

Donna Pelekasis  
Air Force Geophysical Laboratory  
Hanscom AFB, MA  
617/861-241

Machine : AFGL  
Bldg. : 1107  
Rm. : 120

BARTOL RESEARCH FOUNDATION  
-----

Discipline: Solar Terr.

William Matthaeus  
University of Delaware  
Bartol Research Foundation  
Newark, Delaware 19716  
302/451-8111

Machine :  
Bldg. : Sharp Lab  
Rm. : 217

U of Maryland  
-----

Discipline: Solar Terr.

Dr. Chuck Goodrich  
Dept of Physics and Astronomy  
University of Maryland  
College Park, MD 20742  
301/454-5938

Machine :  
Bldg. : Space Sciences Bldg.  
Rm. : 1235

**NRL**

----

Dr Paul Rodriguez  
David Walker (Alt)  
Code 4706  
NRL  
Plasma Physics Division  
455 Overlook Ave.  
Washington, DC 20375  
FTS 767-3844  
FTS 767-3329 (Alt)

**Discipline: Solar Terr.**

Machine :  
Bldg. : 209  
Rm. : 320A

**APL**

----

Lora Suther 2-150  
JHU APL  
Johns Hopkins Rd.  
Laurel, MD 20707  
(301) 953-5000 x84

**Discipline: Solar Terr.. Planetary**

Machine : S1PVAX  
Bldg. : 2  
Rm. : 50

**Goddard Institute of Space Studies**

-----

Sol Broder  
Rm. 210  
Goddard Institute for Space Sciences  
NASA  
2880 Broadway  
New York, NY 10025  
FTS (664-5500)

**Discipline: Atmospheric**

Machine :  
Bldg. : 26  
Rm. : 132

**PENNST**

-----

Jim Breon  
Penn State University  
423 Walker Building  
University Park, PA 16802  
814/865-9495

**Discipline: Climate**

Machine : PENNST  
Bldg. : Walker Bldg.  
Rm. : 616

**MIT**

----

John Richardson  
MIT  
Cambridge, MA 02139  
617/253-6112

**Discipline: Planetary**

Machine :  
Bldg. : 37  
Rm. : 685

**Cornell University**

-----

Phillip Nicholson  
Dr. Peter Gierasch (Alt)  
Space Sciences Bldg.  
Cornell University  
Ithaca, NY 14853  
607/255-8543 (Exchange converts from 256 to 255 on March 3, 1986)  
607/255-8544 (Alt)

**Discipline: Planetary**

Machine : Astronomy Dept. VAX-11/750  
Bldg. : Space Sciences Bldg.  
Rm. : 310

**LAMONT-DOHERTY**  
-----

Bruce Huber  
LDGO - Oceanography  
Palisades, NY 10964  
914/359-2900

Discipline: Oceans

Machine : VAX-11/780  
Bldg. : Oceanography Bldg.  
Rm. : 202B

**WOODS HOLE OCEANOGRAPHIC INSTITUTE**  
-----

Andy Maffil  
Woods Hole Oceanographic  
Clark 1  
Woods Hole, MA 02543  
617/548-1400 (X2759)

Discipline: Oceans

Machine : VAX-11/780  
Bldg. : Clark Laboratory  
Rm. : 128

**SPACE TELESCOPE INSTITUTE**  
-----

Dr. Peter Shames  
Space Telescope Institute  
3700 San Martin Drive  
Homewood Campus  
Baltimore, MD 21218  
301/338-4748

Discipline: Astrophysics

Machine :  
Bldg. : ST Science Institute Bldg.  
Rm. : 128

**UNIVERSITY OF DELAWARE**  
-----

Ferris Webster  
College of Marine Studies  
University of Delaware  
Lewes, DE 19958  
302/645-4266

Discipline: Oceans

Machine : MicroVAX II  
Bldg. : Cannon Bldg.  
Rm. : 205

**NOAA - NODC**  
-----

Robert Fish  
National Oceanogr. Data Center  
2001 Wisconsin Ave., NW  
Washington, DC  
202/634-7479  
FTS (634-7479)

Discipline: Oceans

Machine : VAX-11/750  
Bldg. : Universal-South Bldg.  
Rm. : Unknown before 2/86

**UNIVERSITY OF RHODE ISLAND**  
-----

Peter Cornillon  
Grad. School of Oceanography  
Kingston, RI 02882  
401/792-6283

Discipline: Oceans

Machine : VAX-11/750  
Bldg. : Watkins  
Rm. : 1st floor computer room

---

**JPL Routing Center Location**

\*\*\*\*\*

**PPDS and JPLnet**

John Piotrowski M/S 264/785  
Jet Propulsion Lab  
4800 Oak Grove Drive  
Pasadena, CA 91109  
(818) 354-5491

Discipline: Solar Terr., Planetary, Earth  
Science

Machine :  
Bldg. : 171  
Rm. : 85

**JPL Tail Circuits**

\*\*\*\*\*

**LOCKHD**

Dayton Datlowe  
0/91-20 B 255  
Lockheed Palo Alto Research  
Laboratories  
3251 Hanover Street  
Palo Alto, Ca. 94304  
415/424-3274

Discipline: Solar Terr.

Machine : LOCKHD  
Bldg. : 255  
Rm. : OE-105

**UNIVERSITY of WASHINGTON**

Douglas W. Potter  
George Pitt (Alt)  
Geophysics Program, AK-50  
University of Washington  
Seattle, Washington 98195  
206/543-9055  
206/543-0208 (Alt)

Discipline: Solar Terr.

Machine :  
Bldg. : Johnson Hall  
Rm. : 365

**TRV**

Sandra Chang  
TRV  
One Space Park  
Bldg R1/1170  
Redondo Bch, CA 90278  
(213) 538-2017

Discipline: Solar Terr.

Machine : TRVATB  
Bldg. : 01  
Rm. : 1120

**AEROSPACE**

Dr. Joseph Fennell  
Space Sciences Laboratory  
The Aerospace Corporation  
El Segundo, California, 90245  
213-648-7075

Discipline: Solar Terr.

Machine :  
Bldg. : 26  
Rm. : 150



**VXBMS (UCLA)**

-----  
Nancy L. Keder  
Molecular Biology Institute  
UCLA  
Los Angeles, CA 90024  
(213) 825-8901

Discipline: Solar Terr..Planetary

Machine : VXBMS  
Bldg. : Slichter Hall  
Rm. : 5880

**LJSP01 and LJSP02 (UCSD)**

-----  
Ed Hoopes  
University of California San Diego  
Center for Astrophysics and  
Space Science  
C-011  
La Jolla, California 92093  
(619) 452-4987

Discipline: Solar Terr..Astrophysics

Machine :  
Bldg. : AP & M  
Rm. : 2839

**UNIVERSITY OF CALIFORNIA, BERKELEY**

-----  
Dr. Forrest Moser  
David Curtis (Alt)  
UC Berkeley  
Space Science Laboratory  
Berkeley, California 94720  
415/642-0549  
415/642-5998 (Alt)

Discipline: Solar Terr.

Machine : VAX-11/750  
Bldg. : Space Scienc Lab  
Rm. : 240

**USU**

-----  
Prof. Joe R. Douppnik  
Center for Atmospheric and  
Space Sciences, UMC-34  
Utah State University  
Logan, Utah 84322  
(801) 750-2982

Discipline: Atmospheric

Machine : USU  
Bldg. : Lund Hall  
Rm. : 101

**STAR**

-----  
Dr. Calvin C. Teague  
Center for Radar Astronomy  
Durand Building, Room 229  
Stanford, California 94305  
415-497-3596

Discipline: Solar Terr..Atmospheric,  
Spacelab

Machine : STAR  
Bldg. : Durand  
Rm. : 216

**ARIZONA**

-----  
Joe Gotobed  
Lunar and Planetary Lab  
The University of Arizona  
Tucson, AZ 85721  
602/621-4021

Discipline: Planetary

Machine : MicroVAX II  
Bldg. : 92  
Rm. : 429

**University of Hawaii**

---

Karl Hinck  
University of Hawaii  
Planetary Geosciences  
2525 Correa Road  
Honolulu, Ha 96822  
(808) 948-6321

**Discipline: Planetary**

Machine : UHPGVX2  
Bldg. : Sinclair Library  
Rm. : 6

**Cal Tech**

---

Ed Danielson  
California Institute of Technology  
Geology and Planetary Science  
169D S. Mudd  
Pasadena, Ca 91125  
(818) 356-6861

**Discipline: Planetary, Astrophysics**

Machine : JUPITI  
Bldg. : South Mudd  
Rm. : 169D

**UC SANTA BARBARA**

---

Ray Smith  
Geography Dept.  
University of California  
Santa Barbara, CA  
805/961-2618

**Discipline: Oceans**

Machine : VAX-11/750  
Bldg. : Engineering Bldg. 1  
Rm. : 3152

**OREGON STATE U.**

---

Dudley Chelton  
College of Oceanography  
Oregon State University  
Corvallis, OR 97331

**Discipline: Oceans**

Machine : MicroVAX II  
Bldg. : Oceanography Bldg. 1  
Rm. : 444  
**Discipline: Planetary, Earth Science**

**JPL**

---

Burt Goldstein  
Mail Stop 202-101  
4800 Oak Grove Drive  
Pasadena, CA  
408/354-7452  
FTS (792-7452)

**Discipline: Oceans**

Machine : VAX-11/780  
Bldg. : 202  
Rm. : 101

**NAVY POST GRAD SCHOOL**

---

James Mueller  
Dept. of Oceanography  
Naval Post Graduate School  
Monterey, CA 93943-5100  
408/646-3268

**Discipline: Oceans**

Machine : VAX System  
Bldg. : Root Hall  
Rm. : 123

**UNIVERSITY OF ALASKA**

---

David Fritte  
Geophysical Institute  
University of Alaska  
Fairbanks, AK 99775-6800

**Discipline: Oceans**

Machine : VAX-11/780 or VAX-11/785  
Bldg. : Elvey Bldg.  
Rm. : 219

**SCRIPPS INST. OF OCEANOGRAPHY**

-----  
Mark Abbott  
Scripps Inst. of Oceanography  
University of California, A-002  
La Jolla, CA 92093  
619/452-4791

**Discipline: Oceans**

Machine : MicroVAX II  
Bldg. : Scripps Satellite Oceanographic  
Rm. : Facility in trailers

-----  
Eric Eliason  
United States Geological Survey  
Astrogeology  
2255 N. Gemini Drive  
Flagstaff, Az 86001  
(602) 527-7113

Machine : ASTOG  
Bldg. : 4  
Rm. : 40

**AMES**

-----

Maureen Ockert  
Ames  
Mail Stop 245-3  
Moffet Field, California 94035  
414/694-5593  
FTS (464-5593)

**Discipline: Earth Science**

Machine :  
Bldg. : 240  
Rm. : 111

-----  
JSC Routing Center Location  
=====

Johnson Space Center \*  
-----

Discipline: Planetary

Dan Anderson  
JSC  
Code SN  
Houston, TX 77058  
FTS (525-4464)  
713/483-4464

Machine : SM  
Bldg. : 31  
Rm. : 262A

JSC Tail Circuits  
=====

ESSDP1 and ESSDP2 (LANL)  
-----

Discipline: Solar Terr.

Steve Blair  
Mail Stop D440  
Los Alamos National Laboratory  
P.O. Box 1663  
Los Alamos, NM 87545  
Office: (505)667-9211  
Group Office: (505)667-9268

Machine : ESSDP2  
Bldg. : SM40  
Rm. : N114A

FTS (843-9211)  
FTS (843-9268)

Rice University  
-----

Discipline: Theory Solar Terr.

Professor Patricia Reiff  
Rice University  
Dept. of Space Physics and  
Astrophysics  
P.O. Box 1892  
Houston, Texas 77251  
713/527-8101, ext. 2650

Machine : MicroVAX II  
Bldg. : Space Science Bldg.  
Rm. : 263

UTD  
---

Discipline: Solar Terr., Atmospheric

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Rm. : 138

Discipline: Atmospheric

Machine : Micro PDP-11  
Bldg. : Mesa Lab  
Rm. : 498

Discipline: Atmospheric, Astrophysics

Machine : LASP DECnet router  
Bldg. : Duane Physics Complex  
Rm. : D322

Discipline: Planetary

Machine : VAX-11/780  
Bldg. : McGetchin Hall  
Rm. : M203

Discipline: Oceans

Machine : RSC Bldg. 2  
Rm. : 261

Discipline: Oceans

Machine : VAX-11750  
Bldg. : Oceanogr. & Meteor. Bldg.  
Rm. : 617